

IV. REMARKS

1. The specification is amended to include headings. The abstract is amended. The title is modified as proposed by the Examiner. Claims 9, 11 and 19 are amended to correct the antecedent basis errors noted by the Examiner. Claims 8 and 18 are amended to define the variables recited in the claims. The changes to the claims do not further limit or narrow the scope of the claims and are not made for reasons related to patentability.

Applicant appreciates the Examiner's indication of allowable subject matter in claims 5 and 15. However, for the reasons stated below, Applicant believes the present claims to be allowable over the cited art.

2. Claims 1-4, 6, 11-14, 16, 21 and 22 are not unpatentable over Lindoff et al. ("Lindoff") (U.S. Patent No. 6,700,882 B1) under 35 U.S.C. §103(a).

Lindoff discloses a method and an apparatus for increasing data throughput and/or capacity in a TDMA system (abstract). Lindoff does not aim to solve the same problem as the present invention, which is performing a channel estimation in a receiver. Lindoff discloses three embodiments that are explained in the Summary of the Invention section. Space diversity is a common factor for all these methods. This means that two separate antennas are used in the transmitter (see Summary and Figures). The method according to Lindoff allows increasing throughput per link or decreasing cluster size (Col. 1, lines 48-50).

Applicant's invention relates to a data transfer in mobile communications systems. Training sequences are needed to aid a receiver to estimate channel quality and it can then use this

information to compensate signal distortions. FIG. 4 depicts a frame used e.g. in a GSM communications system. From that Figure, the position of a training sequence in a frame can be seen. Currently when several transmitting antennas are used, a separate training sequence is selected for each transmission branch, as well as separate training sequences for signals intended for different wireless communications devices. It is an aim of the present invention to provide a method and a system for performing a channel estimation in a receiver. Applicant's invention is based on the idea of transmitting a signal to different transmission antennas in such a manner that, in the signals transmitted in different antenna branches, the same training sequence is used so that the phase of the training sequence is different in antenna branches. This is not disclosed or suggested by Lindoff.

Rather, Lindoff solves a different problem. In Lindoff's invention the fact that the signals traverse different paths (due to space diversity) is used in order to distinguish and separate different signals at the MS (Col. 4, lines 10-15). Meanwhile, in Applicant's invention it is essential that even if the signals have the same training sequences, they can still be separated because of different phases of training sequences. Referring to Lindoff's invention, in FIG. 5b, which the Examiner referred to, different uplink sequences are transmitted by using only one transmission antenna (Col. 6, lines 26-34). FIG. 9 of Lindoff merely illustrates that instead of using phase offsets to simultaneously transmit different data sequences and training sequences uplink to the BS on the same carrier frequency, a mobile station with 2 antennas can omit the phase-offsets and simply transmit one data sequence and training sequence using one of the MS antennas 230, 730, while simultaneously transmitting

the other data sequence and training sequence using the other one of the MS antennas 230, 730. (Col. 8, lines 24-33). This is not the same as Applicant's invention, where as recited in claim 1, a different phase of the same training sequence is used in data frames transmitted through different antennas. Thus, combining FIGS. 5b and 9 cannot be considered obvious, and even then, how could it be concluded that only training sequences have different phases?

Thus, claims 1, 11, 21 and 22 are not disclosed or suggested. Claims 2-4, 6, 12-14 and 16 should be allowable at least by reason of their respective dependencies.

3. Claims 7 and 17 are not unpatentable over Lindoff and Guan under 35 U.S.C. §103(a) at least by reason of their respective dependencies, for the reasons noted above.

Furthermore, Guan is not analogous art and there is no motivation to combine Guan with Lindoff for purposes of 35 U.S.C. §103(a).

Applicant respectfully notes that Lindoff and Guan have been combined improperly. References may be combined under 35 U.S.C. §103(a) only if the references are analogous art. In this case Lindoff and Guan are not analogous art. A reference is analogous art if:

- 1) The reference is in the same field of endeavor as the applicant's, or
- 2) The reference is reasonably pertinent to the particular problem with which the applicant was concerned.

Lindoff is directed to increasing data throughput and/or capacity in a TDMA system. (Abstract). Guan, on the other hand, relates

to transmitting a digital television signal which provides audio, video and data packets alternating with training signals. (Abstract).

In Guan's method, interference to other systems is minimized. This is unlike Applicant's invention where interference between training sequences is minimized. Moreover, Guan's invention is related to QAM television signals.

Thus, Guan is non-analogous art and cannot be combined with Lindoff for purposes of 35 U.S.C. §103(a).

Furthermore, it is submitted that there is no motivation to combine Lindoff with Guan to achieve Applicant's invention, as is required for obviousness under 35 U.S.C. §103(a). In order to establish a *prima facie* case of obviousness under 35 U.S.C. §103(a), there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or combine reference teachings. There must also be a reasonable expectation of success, and the reference(s), when combined, must teach or suggest all of the claim limitations. (See M.P.E.P. §2142). As noted above, the combination of Lindoff and Guan does not disclose or suggest each feature of Applicants' invention as claimed.

Additionally, neither reference provides the requisite suggestion or motivation to modify the references as proposed by the Examiner. The Examiner's proposition that Applicants' invention would be obvious as recited in the claims is not supported by the factual contents of Lindoff and Guan.

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to transmitting a digital television signal which provides audio, video and data packets alternating with training signals. (Abstract).

In Guan's method, interference to other systems is minimized, unlike Applicant's invention where interference between training sequences is minimized.

Thus, the references themselves and/or the knowledge generally available to one of skill in the art does not provide the requisite motivation or suggestion to modify the references as proposed for purposes of 35 U.S.C. §103(a). When "the PTO asserts that there is an explicit or implicit teaching or suggestion in the prior art, it must indicate where such a teaching or suggestion appears in the reference". In re Rijckaert, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993). The Examiner is requested to provide an indication as to where any such teaching, suggestion or motivation appears in the references. Absent such a teaching, it is submitted that a *prima facie* case of obviousness over Lindoff and Guan under 35 U.S.C. §103(a) is not established.

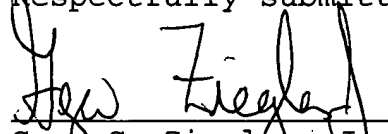
4. Claims 9, 10, 19 and 20 are not unpatentable over Lindoff and Persson et al. ("Persson") under 35 U.S.C. §103(a).

Claims 9, 10, 19 and 20 should be allowable at least by reason of their respective dependencies. Furthermore, the combination of Lindoff and Persson does not disclose each feature of Applicant's invention, and the combination is improper. While Lindoff deals with increasing throughput and capacity in a TDMA system, Persson is directed to performing macrodiversity or soft handover in TDMA radio communication. This, not only are Lindoff and Persson non-

- analogous art, but there is not motivation to make the proposed combination.
- For all of the foregoing reasons, it is respectfully submitted that all of the claims now present in the application are clearly novel and patentable over the prior art of record, and are in proper form for allowance. Accordingly, favorable reconsideration and allowance is respectfully requested. Should any unresolved issues remain, the Examiner is invited to call Applicants' attorney at the telephone number indicated below.

The Commissioner is hereby authorized to charge payment for any fees associated with this communication or credit any over payment to Deposit Account No. 16-1350.

Respectfully submitted,


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